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EDITORIAL

Medical Education and Practice in Malaysia, Quo Vadis?

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As of June 2016 there are 28 medical schools [1] in both private and public sectors in Malaysia offering more than twice as many programs [2] with yearly graduates of about 4500 including those that graduated from overseas. This magnitude is beyond the usual capacity of Ministry of Health (MOH) that is entrusted to accord preregistration training posts to the graduates as the whole process of allocation to available places in public hospitals nationwide is painfully slow. It is already a tragedy having to wait 6 months on average for a placement but words that a delay for up to a year can occur is totally unacceptable when the actual training places available at grade DU41 preregistration house officers is said to be more than the graduate number [3]. Delay can be detrimental to the training itself because waiting is a waste of talent and potential, a disincentive to a young aspirant, tacitly is a testimony of system failure and deprives the public of highly trained graduates to serve in our healthcare system that ironically suffers from chronic and ever growing wait but yet we have excess medical graduates. Some of them have taken a simple and quick route out of the mess by migrating to our neighbours near and far, not entirely their faults, but their thresholds to despair seem very low indeed. The need for a speedy and right solution to the delay is long overdue and this is nothing more than what the public and the young doctors deserve.

How did we get to this? Not unexpectedly but the magnitude stemmed from the unusually large number of *Sijil Pelajaran Malaysia* (SPM; Malaysia Certificate of Education) leavers that opted to study medicine, in part made easy by the many medical schools in the country and those that have been accredited abroad. This was augmented by the constant reminder of the need for more doctors, parental or hype pressure perhaps for whatever reasons, and also the ease with which scholarships were available to study medicine. The principle driver for the whole mess was money initiated by those who wish to make profits under these "fortunate" circumstances [4]. The resulting deluge of medical graduates clogged the system up and unfortunately created many of the unnecessary challenges that we face today. Paradoxically despite this excess our doctor population ratio is still lower than the Organization for Economic Cooperation and Development (OECD) average and our more prosperous neighbour in the south. These veiled and unscrupulous drivers are addressing the gap in ratio with such a speed that it strains the system to almost breaking point and had somewhat ruffled both Ministry of Higher Education (MOHE) and MOH.

The doctor number that we need should ideally be planned or rather managed at this point and this can only be done by addressing all the factors that had led us to this. For a start we should look at the basic question of what the country needs in the future (2020 and beyond) and then work backwards. This sounds simple enough but in practice this is where the challenge lies. Two ministries MOH and MOHE are both looking at the issue albeit with different focus but inevitably with some overlapping jurisdiction. The MOH concerns with the nation's health issues and MOHE deals with medical education and consequently doctor number, although seemingly separate but in actual fact they will converge. Whatever the number of medical students approved at Malaysian Qualifications Agency (MQA) / Malaysian Medical Council (MMC) or sponsored by *Jabatan Perkhidmatan Awan* (JPA; Public Services Department) /MOHE the final tally in five years will be the medical graduates that will have to be allocated to training places. Too many medical

graduates too soon appear to be the main problem and therefore it is high time that we try to regulate the number that goes into training. Immediate actions are required too to restore public confidence in the light of unsympathetic media comments. This includes policies that require hard choices such as derecognizing some foreign medical schools in the archaic list of schedule 2 and introducing the right to practice examination for those who have graduated from abroad. Both can regulate number and consequently emphasize quality.

The next challenge is the specialist number now that doctor number at lower grades will address the gap in ratio in time. Although a lot has improved but by most estimates the number of specialists must double to take up the challenges of a developed nation status and we need to add to this the question of disparity (uneven number by specialty) and geographical mal-distribution, unfortunately the issues remain despite numerous incentives introduced by MOH over the years. An easier question of churning up specialist number can be addressed rather immediately because we have a robust, economical, and internationally respected system within our midst that is the Master in Medicine (MMED). But when the issue of increasing the specialist number is debated, the discourse mystically takes a pathetic course to the times when postgraduate medicine began in the country in the 60s, a return to our colonial ancestry for training opportunities and supervision. When postgraduate medicine first started we indeed relied heavily on the hospitals in the United Kingdom (UK) and their college exams but these are things of the past. Except for stated and specific niche areas for training and education, or occasional exception, by and large we have existed and trained our specialist independently from the system in the UK for more than three decades. For the record, to date more than 8000 specialists have graduated from MMED system and for a rapidly growing Malaysia this number is huge. Especially so for the surgical based specialties that are the most challenging to train and in all domains the surgeons have been at par with the very best in the world. In fact from our own survey, MMED trained specialists are the backbone of doctors that service the public hospitals and clinics in Malaysia.

Despite this apparent regression, the universities that offer MMED are in the process of institutionalizing the training pathway and system to maintain the quality and improve the process further. Steps are taken to formalize the training pathway via MQA and MOHE to reinforce public perception of the system and in preparation for soon to be implemented trade and economic liberalization in ASEAN. For practical purposes the MMED system essentially has two types; one that is based on the presence of the faculty's own teaching hospital and the other on the absence of one and thus reliance on the state hospital as the faculty's affiliated teaching hospital. Both models have achieved success and maintained the quality and competency required by a robust comprehensive assessment system that includes standardized examinations attended by a wide selection of examiners in the country and abroad. In the next 5 years or so, the training environment to some extent the MMED will undergo a significant change with the completion of another 7 teaching hospitals and the incorporation of a consortium of university teaching hospitals. With an estimated number of nearly 10000 tertiary care beds at peak activity this will provide an excellent opportunity to train more specialists and partake in subspecialty training. This includes research and teaching activities that will enhance the return on investment to the public.

Based on the cumulative years of experience and a much more organized MQA the future of medical education for both undergraduate and postgraduate looks very promising indeed but the main lingering issues in both must be addressed. For undergraduate medicine the need to maintain a robust and stringent control on quality is paramount and data shows that the emphasis of this is mainly on graduates from some foreign medical schools because the local ones are subject to very stringent accreditation exercise and compliance audit, therefore quality is assured. Another strategy to achieve this is the introduction of fitness to practice examination for foreign medical school graduates. Both will help control number. The main issue that is affecting postgraduate education is the need to institutionalize the MMED for the future and the creation of teaching hospitals consortium by working closely with MQA and MOHE. This will ensure the best deal for the public. The future is in our hands.

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ORIGINAL ARTICLE

The Prevalence of Depression and its Relationship to Health Related Quality of Life among Prostate Cancer Patients in Tertiary Centres, Kuala Lumpur

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ABSTRACT

Introduction: To determine the prevalence of depression and its relationship with health related quality of life among prostate cancer patients in tertiary medical centres, Kuala Lumpur. **Methods:** A hospital-based, cross-sectional study was conducted at the Surgical Clinic, University Malaya Medical Centre and Universiti Kebangsaan Malaysia Medical Centre over a period of fifteen months. Depression level was measured using Depression Anxiety Stress Scale (DASS-21) and the health related quality of life was measured using the Short Form-36 (SF-36). **Results:** The prevalence of depression was 11.9% (95% CI: 7.0 – 17.0). The total quality of life for non-depression group was 72.30 ± 13.38 and depression group was 54.11 ± 14.59. All the domains in the health related quality of life and coefficient summaries showed significant differences. Univariate analysis showed significant differences in the physical coefficient summary ($p < 0.001$), mental coefficient summary ($p < 0.001$) and total quality of life ($p = 0.002$) among groups with different depression status. In multivariate analysis, the adjusted mean score of the quality of life was associated with age category of the patients ($p = 0.012$), urinary complaint of hematuria ($p = 0.009$) and history of orchidectomy ($p = 0.023$). **Conclusions:** The prevalence of depression among prostate cancer patients was relatively low. Treatment of the urination and prostate related problems may improve the quality of life among prostate cancer patients with depression.

KEYWORDS: Prevalence, depression, health related quality of life, prostate cancer

INTRODUCTION

Depression is a normal response to loss or misfortune and such response may be called grief or mourning. However, depression is abnormal when it is out of proportion to the misfortunes or is unduly prolonged [1]. Depression can occur in any psychiatric disorder. The symptoms of depressed mood are component of many psychiatric syndromes and are also commonly detected in certain physical diseases [1, 2]. In general, the prevalence of depression for women ranges from 5-12%, while among men it ranges from 2-3% [3]. Scientists believe that depression has a biochemical basis. It reflects the neurotransmitter and hormonal imbalances that affect the brain functions. Researchers have detected decreased levels of serotonin and dopamine in the brain of people who have chronic or severe depression [4].

Prostate cancer is the second most common cancer in men with an incidence 25.3 per 100,000 worldwide and the second leading cause of cancer-related death in man [5-7]. The incidence of prostate cancer is rising steadily with a global estimate of 3% increase every year [8]. It was estimated that 217,730 men will be diagnosed with and 32,050 men will die of prostate cancer in the year 2011 [9]. In developed part of the world, prostate cancer accounts for 9.7% percent of cancer in men whereas in underdeveloped world it accounts for only 4.3% [10].

Prostate cancer patients experience greater incidence of clinically significant depression than men without prostate cancer [11, 12]. Additionally, men with prostate cancer have higher rates of depression compared to men in the general population [13]. Study by Walker J et al., [14] reported that the prevalence of depression among prostate cancer patients was 8.2% which was lower compared to depression among psychiatric outpatients (24%) [15] and patients who attended general practice [18.5% (95% CI: 16.5 – 20.6)] [16].

Prostate cancer patients have been reported to experience depression while undergoing treatment. Among those who were treated with radiotherapy, 27% suffered with significant levels of depression [13] and those who had orchidectomy had a slightly higher risk for depressive disorder (RR = 1.15; 95% CI, 1.03 – 1.27) [17]. The risk for depressive disorders was 1.13% (95% CI: 1.08 – 1.19) among prostate cancer patients who received androgen deprivation compared to patients without cancer [17]. However, hormonal therapy does not appear to cause significant depression among men with locally advanced prostate cancer. The rate of mild depression was found to vary from 10.4-16.3% over a period of 12 months with no significant differences at different time points [18].

In early prostate cancer, the assessment of health related quality of life (HRQOL) is mostly evaluated with regards to the degree of urinary incontinence, sexual impotence after treatment and patients' satisfaction with the outcome [19-23]. The clinicians and patients must consider the impact on quality of life (QOL) when choosing primary therapy since the complications such as sexual, urinary and bowel dysfunction are likely in localized prostate cancer [24]. Many studies have revealed that symptomatic advanced prostate cancer has significant impact on QOL [22]. Men with advanced prostate cancer are typically treated with hormone therapy along with chemotherapy and/or radiotherapy to alleviate pain due to bony metastases [25]. Being married, having better education and being more affluent tends to slow the rate of decline in the physical domain of HRQOL [26]. The clinicians' estimate of QOL impairment was found to be accurate for more than 60% of patients. Spiritual well-being (SWB) was shown to have a strong relationship with QOL but was not associated with the overall accuracy of clinicians' judgment in advanced cancer patients [27].

Many studies have been done to estimate the QOL and depression among prostate cancer patients. However, studies have not been done to determine prevalence of depression and its relationship with HRQOL among prostate cancer patients and to determine the factors contributing to the difference in the QOL between the two depression status groups. Therefore, this study was conducted to determine the prevalence of depression and its relationship with HRQOL among prostate cancer patients at tertiary centres in Kuala Lumpur.

METHODS

Study Design

It was a hospital-based, cross-sectional study involving prostate cancer patients attending surgical clinics at University Malaya Medical Centre (UMMC) and Universiti Kebangsaan Malaysia Medical Centre (UKMMC), Kuala Lumpur.

Selection of the Patient

All patients aged 50 years and above with diagnosis of prostate cancer were invited to participate in the study. The patients were chosen arbitrarily by using convenience sampling. The patients who came from 1st August 2011 to 30th September 2012 were invited to participate in the study. We excluded those who could not read and write Malay or English languages, patients with psychiatric problem and those with ongoing treatment for psychological problem.

Method of Data Collection

Three methods of data collection used in this study included: face to face interview using self-structured questionnaire, review of medical record and self-administered questionnaire. Face to face interview using self-structured questionnaire was administered to collect primary data on the socio-demography, past medical and surgical history and sign and symptoms related to urination. Face to face interview enabled the investigator to clarify the questions, clarify the inconsistent answer from the participants and reduce

information bias by the participants. Patient's medical records were reviewed to countercheck the information given by the participants and to obtain information on the past medical and surgical illness, drug histories and cancer status of the patients. Self-administered questionnaire was administered to assess the HRQOL and depression.

Assessment of Health-Related Quality of Life (HRQOL)

The HRQOL was assessed using Short Form Health Survey with 36-items (SF-36). SF-36 is a generic measure of health status as opposed to one that targets a specific age, disease or treatment [28] and it is a practical and valid instrument for use among older people [29]. The SF-36 comprises 36 items including eight domains targeting Physical Component Summary (PCS) and Mental Component Summary (MCS) which are suitable to measure the impact of intervention [30]. The eight domains are: Physical function (PF); role physical (RP); bodily pain (BP); mental health (MH); role-emotional (RE); vitality energy; general health perception (GH) and social functioning (SF). Physical function, role physical and bodily pains domains include questions that are strongly correlated to PCS such as those about physical health and possible limitations due to physical health. Whereas, mental health, role emotional and social functions are strongly correlated with MCS. Vitality and social function domains correlate significantly with both summaries and include questions about the feelings and possible limitations due to emotional problems [31].

Each of the eight domains scored from 0 to 100 with higher score indicating higher function [32]. The SF-36 has been shown to be reliable and valid [33]. The English version of SF-36 has been translated to Malay language by a group of researchers from University of Science, Malaysia (USM) under the International QOL Assessment (IQOLA) Project [34].

Assessment for Depression Score

Depression score was assessed using Depression Anxiety Stress Scale Version-21 (DASS-21) [35]. DASS-21 comprises twenty-one items that are divided into three sub-scales that measure depression, anxiety and stress. There are seven items for depression (DASS-Depression), seven items for anxiety (DASS-Anxiety) and seven items for stress (DASS-Stress). The DASS-Depression assesses the dysphoria, hopelessness, devaluation of life, self-deprecation, anhedonia, inertia and lack of interest [35]. The items were ranked on a 4-point Likert scale, and assessed stressful experiences over previous one week. The responses ranged from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). The individual items were summed and timed twice to get the final total stress score, with higher scores indicating greater stress level. The depression was classified depending on the score of DASS-Depression (35): (i) 0 – 9: Normal; (ii) 10 – 13: mild depression; (iii) 14 – 20: moderate depression; (iv) 21 – 27: severe depression; and (v) ≥ 28: very severe depression.

The original DASS-Depression, DASS-Anxiety and DASS-Stress subscales have Cronbach's alpha ranging from 0.76 to 0.84 and the internal consistency ranging from 0.83 to 0.91 [35]. The Malay language translation of DASS-21 have demonstrated good concurrent and criterion-related validity [36]. The Cronbach's alpha for Malay version of DASS-Depression was 0.84. DASS-21 has been used to measure the dimension of depression, anxiety and stress among clinical sample [37] and non-clinical sample [38].

Statistical Analysis

The data was analysed using Statistical Package for Social Science (SPSS) version 20.0 (SPSS Inc, Chicago, IL). The scoring for the QOL was performed using Microsoft Excel, Quality Metric SF-HRQOL scoring software (Quality Metric Incorporated, Lincoln, RI). The score of depression and total QOL were entered as continuous variables. The prevalence of depression was calculated after binary classification of the score of depression (depression and no depression). All independent variables were entered as categorical.

The hypothesis testing in this study was to determine whether there was any difference in the mean of total HRQOL between depression status adjusted groups with reference to other independent variables. The association between independent variables, the depression status (yes and no) and the score of QOL was analyzed by using two-way analysis of variance

(ANOVA). Results that showed statistical significance were re-analyzed using multi-factorial ANOVA to control for the confounding factors. After developing model, checking for the interaction and model assumption were done for the final model to find the factors that associated with the differences in QOL between two depression status groups among prostate cancer patients.

RESULTS

A total of 193 patients with prostate cancer were recruited during the study period. The response rate was 93.4%. The internal consistency of the items in the DASS-Depression and SF-36 QOL were determined using Cronbach's α. The highest score for depression was 26 and the lowest score for stress was 0. The highest score of HRQOL was 98.13 and the lowest score was 30.00. The Cronbach's α for DASS-Depression was 0.761 and for SF-36 QOL was 0.718. Table 1 shows the patient's socio-demographics, medical and surgical characteristics and current prostate cancer status.

The prevalence of depression was 11.9% (95% CI: 7.0 – 17.0). There were 170 (88.1%) patients without any depression; 13 (6.7%) were having mild depression; 9 (4.7%) having moderate depression and one (0.5%) was having severe depression. There was no patient with very severe depression

Table 2 shows the distribution of the scores of all the domains of the HRQOL, two summary statuses and total QOL stratified by depression status. All the domain scores of the non-depression group were higher compared to depression group. In depression group, the highest score domain was mental health and the lowest score domain was role physical (72.87 and 22.83 respectively). In non-stress group as well the highest score domain was mental health and the lowest score domain was role physical (83.81 and 62.35 respectively). For the PCS, MCS and total QOL, the non-depression group scores were higher compared to depression group (69.41 vs 49.68, 75.40 vs 61.29 and 72.30 vs 54.11, respectively).

Table 1 Patient's socio-demographics, medical and surgical characteristics and current prostate cancer status

Patients' characteristics		**Number of patients (N = 193), n (%)**
a) Patients' socio-demographics		
Age	< 60	10 (5.2)
	60-69.9	54 (28.0)
	70-79.9	99 (51.3)
	> 80	30 (15.5)
Race	Malay	60 (31.1)
	Chinese	101 (52.3)
	Indian & Sikh	28 (16.6)
Marital status	Married	172 (89.1)
	Not married	5 (2.6)
	Widow	16 (8.3)
Number of children	< 5	120 (62.2)
	> 5	73 (37.8)
Living condition	Alone	11 (5.7)
	With partner / family	182 (94.3)
Educational level	Tertiary	73 (37.8)
	Secondary	109 (56.5)
	Primary	11 (5.7)
Smoking status	Never smoke	83 (43.0)
	Ever smoke	110 (57.0)
Consuming alcohol	Never drinker	139 (72.0)
	Ever drinker	54 (28.0)
b) Patients' medical & surgical characteristics		
Comorbidities	Yes	168 (87.0)
	No	25 (13.0)
History of surgery	Yes	119 (63.0)
	No	74 (37.0)
Medical conditions	Hypertension	114 (67.9)
	Hyperlipidemia	65 (38.7)
	Diabetes mellitus	56 (33.3)
	Heart disease	58 (34.5)
	Gout / Joint problem	28 (16.7)
	Asthma	12 (7.1)
c) Current prostate cancer status		
Life in cancer	< 5 years	142 (73.5)
	> 5 years	51 (26.4)
Presenting PSA	< 100 ng/ml	135 (73.8)
	> 100 ng/ml	48 (26.2)
Type of cancer	Adenocarcinoma	193 (100.0)
Gleason score	< 7	85 (44.0)
	7	55 (28.5)
	> 7	53 (27.5)
Latest PSA	< 4 ng/ml	114 (59.1)
	> 4 ng/ml	79 (40.9)
Metastases	Yes	113 (58.5)
	No	80 (41.5)
Treatment	Active Surveillance	19 (9.8)
	Orchidectomy	29 (15.0)
	Radical prostatectomy	21 (10.9)
	Radiotherapy	60 (31.1)
	Tablet Casodex	51 (26.4)
	Injection Lucrine	52 (26.9)
	Injection Zoladex	86 (44.6)
Family history of prostate cancer	Yes	51 (26.4)
	No	142 (73.6)

Table 2 The distribution of the scores of all the domains of the HRQOL, two summary statuses and total QOL by depression status

	Depression (n = 23) [Mean (SD)]	Non-Depression (n = 170) [Mean (SD)]
Physical Functioning	43.48 (29.48)	73.91 (17.80)
Role limitations due to physical health	22.83 (31.00)	62.35 (38.10)
Bodily pain	55.04 (17.05)	69.00 (13.61)
General health perception	65.52 (12.91)	75.08 (13.70)
Vitality	55.22 (12.29)	70.97 (11.77)
Physical Functioning	43.48 (29.48)	73.91 (17.80)
Role limitations due to physical health	22.83 (31.00)	62.35 (38.10)
Bodily pain	55.04 (17.05)	69.00 (13.61)
General health perception	65.52 (12.91)	75.08 (13.70)
Vitality	55.22 (12.29)	70.97 (11.77)
Physical Coefficient Summary (PCS)	49.68 (14.31)	69.41 (14.16)
Mental Coefficient Summary (MCS)	61.29 (14.39)	75.40 (11.88)
Total Quality of Life (QOL)	54.11 (14.59)	72.30 (13.38)

Table 3 shows the comparison of the scores of the domains of the HRQOL and two coefficient summaries among prostate cancer patients with different depression status. There were statistically significant differences in all domains of the QOL, PCS, MCS and the total QOL. This indicates that the overall QOL in the depression group was significantly lower compared to that in non-depression group of prostate cancer patients [mean difference: -18.19 (95% CI: -24.12, -12.26), $p < 0.001$].

Table 3 The comparison of the scores of the domains of the health related quality of life and two coefficient summaries comparing the depression status among prostate cancer patients

Domain	Depression (n = 23) [Mean (SD)] / [Median (IQR)] #	No Depression (n = 170) [Mean (SD)] / [Median (IQR)] #	Mean Difference (95% CI) / Z δ	p-value
Bodily Pain	55.04 ± 17.05	69.00 ± 13.61	-13.96 (-20.11, -7.80)	< 0.001*
General health	65.52 ± 12.91	75.08 ± 13.70	-9.55 (-15.52, -3.59)	0.002*
Vitality	55.22 ± 12.29	70.97 ± 11.77	-15.75 (-20.94, -10.59)	< 0.001*
Social Functioning	59.78 ± 14.57	73.68 ± 16.15	-13.89 (-20.90, -6.89)	< 0.001*
Mental Health	72.87 ± 15.35	83.81 ± 11.83	-10.94 (-16.33, -5.56)	< 0.001*
Role Emotional	66.67 (100.00) #	100.00 (33.33) #	-3.102 δ	0.002*
Physical Functioning	45.00 (60.00) #	80.00 (25.00) #	-4.714 δ	< 0.001*
Role Physical	0.00 (50.00) #	75.00 (75.00) #	-4.418 δ	< 0.001*
Physical Coefficient Summary	49.68 ± 14.31	69.41 ± 14.16	-19.73 (-25.94, -13.52)	< 0.001*
Mental Coefficient Summary	61.29 ± 14.39	75.40 ± 11.88	-14.15 (-19.49, -8.80)	< 0.001*
Total QOL	54.11 ± 14.59	72.30 ± 13.39	-18.19 (-24.12, -12.26)	< 0.001*

CI: confidence intervals; IQR: interquartile range; SD: standard deviation
Z: Mann Whitney U test
* denotes statistically significant at $\alpha = 0.05$

Two-way ANOVA analysis for the association between independent variables, the depression status (yes and no) and the QOL score showed many factors of significance. These factors included: (i) patients' characteristics: age ($p = 0.003$), race ($p = 0.016$), religious ($p = 0.019$) and smoking status ($p = 0.044$); (ii) patients' past medical and surgical illness: history of surgery (any type of surgery besides the surgery that was part of the treatment of prostate cancer) ($p = 0.007$); (iii) current urinary problems: frequency ($p < 0.001$), urgency ($p = 0.007$), nocturia ($p = 0.001$), satisfaction with the micturition ($p < 0.001$), intermittency ($p < 0.001$), dysuria ($p = 0.006$), hematuria ($p < 0.001$) and incomplete emptying ($p = 0.006$); (iv) current cancer status: presenting PSA ($p = 0.001$) and latest PSA level ($p = 0.024$); and (v) treatment: orchidectomy ($p = 0.009$).

Table 4 shows the factors that influenced the QOL after adjustment using multifactorial ANOVA. The only three factors that had statistically significance included: age ($p = 0.012$), hematuria ($p = 0.009$) and history of orchidectomy ($p = 0.023$). The adjusted QOL for depression group was 55.71 (95% CI: 49.64, 61.78) and for the non-depression group was 67.79 (95% CI: 63.09, 72.48). There was significant difference between these two group [F (df): 19.266 (1,165), $p < 0.001$].

Table 4 The factors that influenced the quality of life

Variable	Categories	Adjusted QOL score (95% CI)	Adjusted Mean Difference (95% CI)	F stat (df)	p-value
Age category	Less than 60 years old	70.40 (62.03, 78.77)	reference	3.736 (3,177)	0.012*
	60 - 69.9 years old	61.03 (55.71, 66.34)	-9.38 (-19.99, 1.24)		
	70 - 79.9 years old	58.44 (53.42, 63.46)	-11.96 (-22.34, -1.58)		
	more than 80 years old	57.13 (51.60, 62.66)	-13.27 (-24.83, -1.72)		
Hematuria	Yes	57.88 (51.62, 64.14)	-7.74 (-13.52, -1.97)	6.992 (1,177)	0.009*
	No	65.62 (60.97, 70.27)	reference		
Orchidectomy	Yes	58.90 (52.84, 64.96)	-5.70 (-10.60, -0.80)	5.260 (1,177)	0.023*
	No	64.60 (60.19, 69.00)	reference		

* denotes statistically significant at $\alpha = 0.05$; R2 = 0.447 (Adjusted R2 = 0.400)

DISCUSSION

The prevalence of depression among prostate cancer in this study was relatively low [11.9% (95% CI: 7.0 – 17.0)]. The prevalence found in our study was higher compared to that reported by Walker et al., [14] in Scotland (8.2%) but was lower compared to that reported by Nelson et al., (14 percent) [39], Sharpley & Christie (16 percent) [40] and Driksen et al. (51 percent) [41]. The differences in the findings among studies could be due to use of different questionnaire during assessment and differences in the study design. The prevalence of depression in this study was also lower compared to depression among patients with other clinical conditions such as psychiatric outpatients (24.0 percent) [15], patients who attended to general practice (95% CI: 16.5 – 20.6) (18.5 percent) [16] and other cancer patients [3]. However, men with prostate cancer were shown to have higher rates of depression than men in the general population [13]. One of the studies showed that, clinically, depression among prostate cancer patients reduced from 24% to 12.5% from the time of diagnosis to the time of survey. It was associated with reduction in psychomotor symptoms, agitation, weakness, fatigue and pessimism [42], However, Nelson et al. [43], found a consistent upward trend in mean depression score of a cohort over 5 years.

In this study, overall QOL among depression group was significantly lower compared to non-depression group [mean difference: -18.19 (95% CI: -24.12, -12.26), $p < 0.001$]. Prostate cancer patients with psychological distress were reported to have significantly worse social and emotional functioning [44]. Depressed mood has been associated with significantly decreased scores in all domains of HRQOL [45]. Chronic diseases also have negative effects on HRQOL [46]. Driksen et al., [41] concluded that the higher percentage of depression among prostate cancer was due to impact of the treatment received on the sleep performance as a side effect. In another study, those with highest risk for depression reported greater prostate cancer symptoms and side effect of the treatment [47]. Aass et al., [48] reported that depression was significantly correlated with impaired social life, professional work and previous psychiatric problems. They also found that depression increases in the presence of distant metastases, relapse or disease progression. Mental health condition was also responsible for significantly greater impairment in HRQOL [46] and men with advanced disease were significantly depressed than those with early stage disease [41]. It could be due to more invasive treatment and relatively poor prognosis [44].

In our study, age was also found to affect QOL differently based on the depression status [F (df): 3.3736 (3,177), $p = 0.012$]. Among the older patients, the HRQOL score was significantly different between two groups with different depression status. There was a slow decline in QOL with time among prostate cancer patients due to duration of illness and psychiatric difficulties [49]. Therefore, greater efforts are needed to understand the rehabilitation problems early in diagnosis and treatment and to accordingly target interventions with the aim of reducing later sequelae [49]. However, study by Nelson et al., [43] found that the aging was positively correlated with emotional QOL ($r = 0.16$).

Hematuria is not common in prostate cancer. However, advanced prostate cancer may present with haematuria [50]. Hematuria was found in 21.9% of the patients with cancer. In this study, hematuria significantly affected the QOL score among patients stratified by their depression status. It could be due to

the patients' perception that the treatment was less effective and they may die sooner. Study by Panson et al., [22] found that hematuria was associated with lower QOL among prostate cancer patients and pre-diagnosis, the QOL in patients with hematuria was comparable between patients with bladder cancer and those with other cancers including prostate cancer [51].

In this study, orchidectomy influenced QOL score of prostate cancer patients stratified by depression statuses. It could be due to feeling of hopelessness and difficulties in concentrating or maintaining the daily activities [52]. However, the study by Lucas et al., [53] showed that orchidectomy did not appear to affect QOL.

There were few limitations in our study. Since this was a cross-sectional study, it could not infer the temporal sequence [54] among the depression status, multiple associated factors and the QOL. Although this study found age, hematuria and orchidectomy as the important factors that affect HRQOL differently among the patients with difference in depression status, there was no strong evidence for the causality. An elaborate longitudinal study should be carried out to find the actual associated factors that can affect HRQOL. However, the findings of this study can be generalized to the population with prostate cancer since the sample size was relatively large.

Furthermore, convenience sampling used in this study has a tendency to non-sampling error like selection bias, response bias and non-response bias [55]. Selection bias is the major issue in this sampling method. Patients can easily hide the truth due to precise wording of questions; interviewer attitude and juxtaposition of one question with another which are typical sources of response bias. Therefore, a well-designed probability sampling could minimize the selection bias.

SF-36 [56] and DASS-21 [35] questionnaires are self-administered. Sometimes SF-36 produces different results from those of the primary efficacy outcome and should be utilized more systematically [57]. In this study, reliability analysis was conducted to test the internal consistency of the answers and Cronbach's α was 0.718 for SF-36 and 0.761 for DASS-Depression. Hence, both questionnaires were good for psychometric assessment in this population and there was no issue of unreliability.

Recommendations

In future, clinicians should be trained by professionals to assess the depressive symptoms of their patients and to pay more attention on patients' emotional concerns. Treating the urination and related problem by urologist may improve the QOL among prostate cancer patients with depression.

CONCLUSIONS

The prevalence of depression among prostate cancer patient was relatively low. There was a significant difference in the QOL among prostate cancer patients with difference in the depression status. Patients without depression had relatively higher QOL compared to patients with depression. Both physical and mental coefficient summaries were also lower among prostate cancer patients with depression.

Conflicts of Interest

Authors declare none.

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